

In the Claims

Listing of the Claims

This listing of claims will replace all prior versions, and listings, of the claims in the application.

1/ –(Currently Amended) Method for guiding an automatic cleaning device for a surface submerged in a liquid, ~~this device includes~~including:

- a chassis carrying a device for filtration of the liquid;
- units ~~(15 and 16)~~ for driving the chassis on the surface to be cleaned;
- motors ~~(7)~~ born on the chassis and arranged for transmitting motor movement to at least one part of the drive units ~~(15 and 16)~~;
- electric means ~~(18)~~ for controlling the motors;
- said method including an operation consisting of:
 - detecting changes in the device's inclination corresponding to its passage into a concave junction zone between two portions ~~(30 and 31)~~ of the submerged surface inclined relative to each other ~~and being characterized in that~~
 - on the condition that at least one change of the device's inclination is detected, a cleaning method is begun the consists of at least two reversals of the device's drive direction, with at least one reversal on each surface portion ~~(30 and 31)~~ such that the device passes at least three times over said concave junction zone from one portion of the submerged surface to the other.

2/ – (Currently Amended) Method according to Claim 1, wherein the device comprises at least one inclination sensor ~~(19)~~ suitable for changing state when the device's inclination relative to the horizontal passes through a predetermined reference angle value, and the electronic controls ~~(18)~~ for the motors ~~(7)~~ are adapted to be able to control a reversal of the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~, the specific cleaning procedure includes the following step:

(1) after detection of the state change of at least one inclination sensor ~~(19)~~, a reversal of the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~ is ordered.

3/ – (Currently Amended) Method according to Claim 2, wherein the device comprises a single inclination sensor ~~(19)~~, the specific cleaning procedure comprises after step (1) the following step:

(2) after a predetermined period of time t_1 , a new reversal of the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~ is ordered, where the value of this predetermined period of time t_1 is sufficiently significant to allow the passage of the device from one portion of the submerged surface to the other, but sufficiently short so that said new reversal of drive direction has the effect of again directing the device towards said junction zone.

4/ – (Original) Method according to Claim 3 wherein t_1 is less than 10 seconds.

5/ – (Original) Method according to Claim 4, wherein t_1 is between two seconds and four seconds.

6/ – (Currently Amended) Method according to ~~one of the claims 3 to 5~~ Claim 3 wherein a time delay of length t_1 is begun during step (1).

7/ – (Currently Amended) Method according to Claim 2 wherein the device comprises:

- at least a first inclination sensor suited to detect the device's movement on one of said surface portions referred to as the first portion,

- at least a second inclination sensor suited to detect the device's movement on the second surface portion,

the specific cleaning method comprises the following steps:

(1') the device initially moving on the first surface portion, after detection of the state change of the second inclination sensor(s), a first reversal of the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~,

(2') then, after detection of a state change of the primary inclination sensor(s), a reversal of the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~ is ordered.

8/ – (Currently Amended) Method according to ~~one of the Claims 2 to 7~~Claim 2 wherein at least one inclination sensor ~~(19)~~ is suited for changing state when the device's inclination relative to the horizontal exceeds a reference angle value of order 60°.

9/ – (Currently Amended) Method according to ~~one of Claims 3 to 4~~Claim 3, wherein the steps (1) and (2), or the steps (1') and (2') are repeated at least once.

10/ – (Currently Amended) Method according to ~~one of Claims 3 to 4~~Claim 3, wherein the steps (1) and (2), or the steps (1') and (2') are repeated only once.

11/ – (Currently Amended) Method according to ~~one of the claims 2 to 4~~Claim 2 wherein the execution of the specific cleaning method is ordered upon each detection of a transition of the cleaning device from a horizontal surface portion ~~(31)~~ onto a wall inclined ~~(30)~~ at an angle relative to said horizontal portion greater than or equal to the inclination sensor's ~~(19)~~ reference angle.

12/ – (Currently Amended) Automatic cleaning device for a surface submerged in a liquid comprising:

- a chassis carrying a device for filtration of the liquid;
- units ~~(15 and 16)~~ for driving the chassis on the surface to be cleaned;
- motors ~~(7)~~ born on the chassis and arranged for transmitting motor movement to at least one part of the drive units ~~(15 and 16)~~;
- electric means ~~(18)~~ for controlling the motors ~~(7)~~;
- at least one sensor ~~(19)~~ of the device's inclination suited for detecting changes of the device's inclination corresponding to its passage

over a concave junction zone between two portions ~~(30 and 31)~~ of the submerged surface inclined relative to each other

wherein:

- the electronic control means ~~(18)~~ are suited for beginning, on the condition that at least one change of the device's inclination is detected, a cleaning procedure consisting of at least two reversals of the device's drive direction with at least one reversal on each surface portion ~~(30 and 31)~~ such that the device passes at least three times over said concave junction zone from one per version of the submerged service to the other.

13/ – (Currently Amended) Device according to Claim 12 wherein:

- it includes at least one inclination sensor ~~(19)~~ suited to changing state when the device's inclination relative to the horizontal passes through a predetermined reference angle value,

- the electronic control means ~~(18)~~ are suited for being able to control, after detecting a change of state of at least one inclination sensor, during the specific cleaning method, a step (1) of reversing the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~.

14/ – (Currently Amended) Device according to Claim 13 wherein it includes a single inclination sensor ~~(19)~~ and wherein the electronic control means ~~(18)~~ are suited, after this step (1), and after a predetermined time period t_1 , for ordering a step (2) beginning reversing the direction of the motors driving the drive units ~~(15 and 16)~~, where the value of this predetermined period of time t_1 is sufficiently significant to allow the passage of the device from one portion of the submerged surface to the other, but sufficiently short so that said new reversal of drive direction has the effect of again directing the device towards said junction zone.

15/ -(Original) Device according to Claim 14 wherein t_1 is less than 10 seconds.

16/ – (Original) Device according to Claimed 15 wherein t_1 is between two seconds and four seconds.

17/ – (Currently Amended) Device according to ~~one of the Claims 14 to 16~~ Claim 14, wherein the electronic control means ~~(18)~~ comprise a time delay of measure t_1 .

18/ – (Currently Amended) Device according to Claims 13 wherein:

- it comprises at least a first inclination sensor ~~(19)~~ suited to detect the device's movement on one of said surface portions referred to as the first portion,

- it comprises at least a second inclination sensor ~~(19)~~ suited to detect the device's movement relative to the second surface portion,

- the electronic control means ~~(18)~~ are suited for, during the specific cleaning method:

- the device initially moving on the first surface portion, after detection of the state change of the second inclination sensor(s), a first step (1') of reversal of the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~ is ordered,

- then, after detection of a state change of the primary inclination sensor(s), a second step (2') of reversal of the direction of the motors ~~(7)~~ driving the drive units ~~(15 and 16)~~ is ordered.

19/ – (Currently Amended) Device according to ~~one of the Claims 13 to 18~~ Claim 13 wherein it comprises at least one inclination sensor ~~(19)~~ suited for changing state when the device's inclination relative to the horizontal exceeds a reference angle value of order 60° .

20/ – (Currently Amended) Device according to ~~one of the Claims 14 to 19~~ Claim 14 wherein the electronic control means ~~(18)~~ are suited for repeating the steps (1) and (2), or steps (1') and (2') at least once.

21/ – (Currently Amended) Device according to ~~one of the Claims 14 to 19~~ Claim 14 wherein the electronic control means ~~(18)~~ are adapted so that during each specific cleaning procedure the steps (1) and (2), or steps (1') and (2') are executed only one time.